WATER RESOURCES REVIEW for

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CANADA
DEPARTMENT OF THE ENVIRONMENT
INLAND WATERS BRANCH

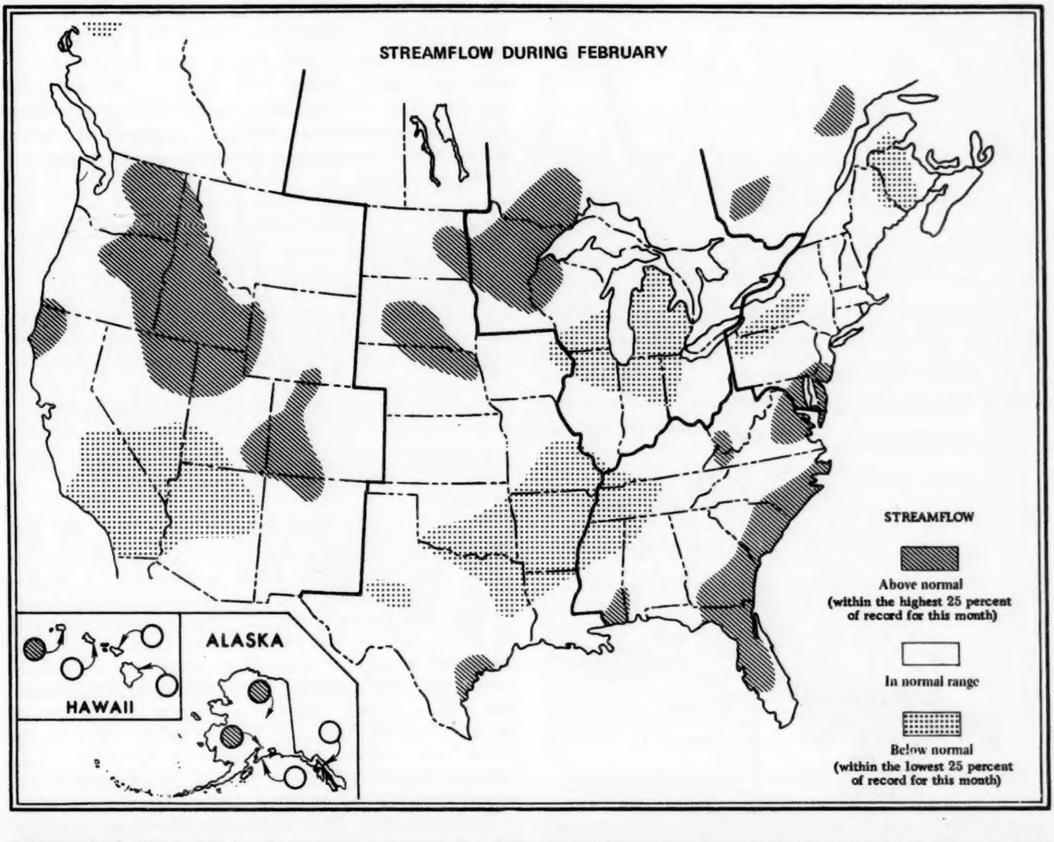
FEBRUARY
1972

STREAMFLOW AND GROUND-WATER CONDITIONS

Large areas of above-normal streamflow persisted in the West and in the northern parts of the Midcontinent and Western Great Lakes regions. In the Southeast, above-normal flow continued in parts of Georgia and South Carolina and expanded into North Carolina and Florida.

Three major areas of below-normal streamflow developed within the West, Midcontinent, Southeast, and Western Great Lakes regions as a result of the seasonal decrease in streamflow and a month of below-normal precipitation.

Major flooding was limited to that which followed the failure of a coal waste bank in southwestern West Virginia.

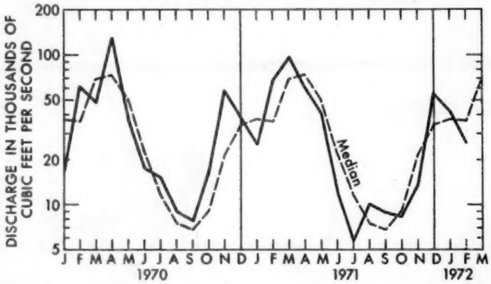


NORTHEAST

[Atlantic Provinces and Quebec; Delaware, Maryland, New York, New Jersey, Pennsylvania, and the New England States]

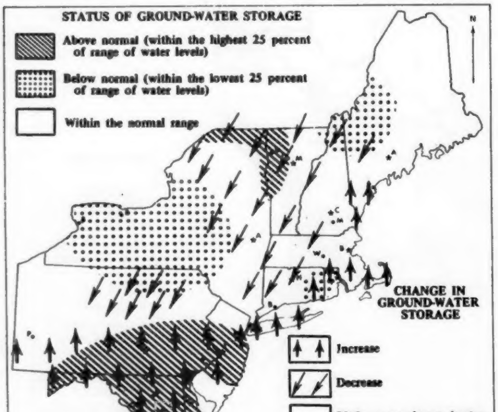
STREAMFLOW DECREASED IN NEARLY ALL PARTS OF THE REGION OTHER THAN IN MAINE AND MARYLAND. FLOWS OF MOST STREAMS WERE IN THE NORMAL RANGE; PRINCIPAL EXCEPTIONS WERE BELOW-NORMAL FLOWS IN NEW BRUNSWICK AND ABOVE-NORMAL FLOWS IN WESTERN AND NORTHEASTERN QUEBEC PROVINCE.

Above-average precipitation in Maryland and adjacent areas caused streams to rise into the above-normal range. Flow of Potomac River at Washington, D.C., on the last day of the month was nearly 66,000 cfs (drainage area, 11,560 square miles), more than 4 times the normal flow for February. Contrasting with this high flow, the end of month discharge of Susquehanna River at Harrisburg, Pa., was about 28,000 cfs, and 77 percent of median for the month as a whole (see graph).



Monthly mean discharge of Susquehanna River at Harrisburg, Pa. (Drainage area, 24,100 square miles.)

Ground-water levels rose in Maryland, southern Pennsylvania, central New Jersey, and southeastern New England (see map). Levels declined in Vermont, western Massachusetts, and eastern New York. Monthend levels were above average in Maryland, Delaware, southern Pennsylvania, and central New Jersey; and were below average in western New York.



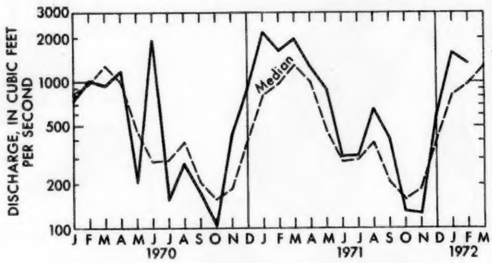
Map shows ground-water storage near end of February and change in ground-water storage from end of January to end of February.

SOUTHEAST

[Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia]

STREAMFLOW DECREASED IN ALABAMA, MISSISSIPPI, TENNESSEE, AND IN NORTHERN AND CENTRAL GEORGIA; AND GENERALLY INCREASED ELSEWHERE IN THE SOUTHEASTERN REGION. FLOWS WERE BELOW NORMAL IN NORTHERN MISSISSIPPI AND WESTERN TENNESSEE. FLOWS IN THE ABOVE-NORMAL RANGE CHARACTERIZED MOST COASTAL AREAS FROM VIRGINIA TO CENTRAL FLORIDA. THE ONLY MAJOR FLOODING WAS THAT WHICH FOLLOWED THE FAILURE OF A COAL WASTE BANK IN SOUTHWESTERN WEST VIRGINIA.

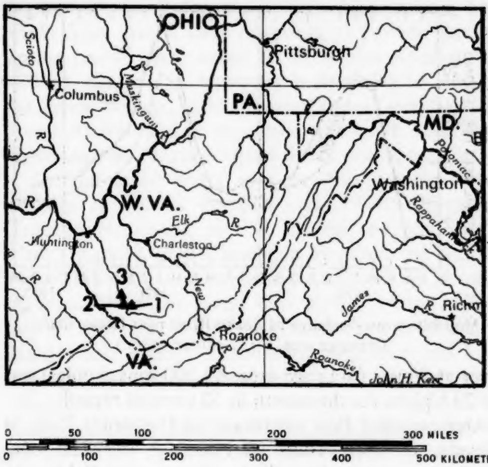
In northern Florida, monthly mean discharge of Suwannee River at Branford (drainage area, 7,090 square miles) was about 20,000 cfs, highest for February in the 42 years of record, and nearly twice the flow of the previous month. Some 200 miles to the west, the monthly flow of Conecuh River at Brantley in southern Alabama, decreased to 1,360 cfs (see graph), but lacked only 30 cfs of remaining in the above-normal range.



Monthly mean discharge of Conecuh River at Brantley, Ala. (Drainage area, 492 square miles.)

In southwestern West Virginia, more than 100 lives were lost on the 26th as the result of the failure of a coal waste bank on Middle Fork, a tributary of Buffalo Creek, about 4 miles upstream from Lorado, in Logan County. The failure of the coal waste bank was preceded by several days of rain totaling more than 3 inches. The estimated volume of water impounded was 21 million cubic feet. The unleashed torrent of water, coal sludge, and debris caused complete or partial destruction of some 16 mining towns in Buffalo Creek valley as the flood crest traveled the 17 miles of the valley at an average rate of 8 feet per second. In addition to the known dead, several thousand persons were homeless.

The location of the mouth of Buffalo Creek (drainage area, 45.6 square miles) is shown as site number 1 on the accompanying map. Peak discharge at the mouth may have been in the range of 7,000 to 10,000 cfs, approximately equal to a once-in-50-year flood; however, if the



Locat^n of stream sites on and near Buffalo Creek, in southwestern West Virginia, referred to in the text.

bank ..d not given way, the flood flow of Buffalo Creek was estimated to have been that likely to occur on the average of once in about 6 years. Buffalo Creek is tributary to Guyandotte River at Man, W.Va. The peak stage on Guyandotte River at Man (crest-stage gage on right bank, 500 feet upstream from Buffalo Creek), site 2 on map, was 20.34 feet at 10:30 a.m. on the 26th; discharge was 34,700 cfs. Previous maximum peak stage during the 44-year period of record was 24.78 feet in March 1963 (discharge, 49,000 cfs). Peak stage (Feb. 26) at the gaging station, Guyandotte River at Logan (drainage area, 836 square miles), site 3 on the map, 12 miles downstream from Man, was roughly 8 feet lower than the previous maximum peak, set in 1963.

In north-central Florida, flow of Silver Springs increased by 10 cfs, to 750 cfs, 94 percent of normal. In the southeastern part of the State, flow of Miami Canal at Miami increased by 7 cfs, to 252 cfs, 81 percent of normal.

Ground-water levels rose in many parts of the region, including much of Alabama, North Carolina, West Virginia, the Piedmont of Georgia, and northern and central Florida. Levels declined in southern Florida and east-central West Virginia. Levels near monthend generally continued above average in North Carolina and West Virginia; and were near or below average in southeastern Florida. In eastern North Carolina, artesian levels continued to decline in heavily pumped areas. Levels declined also in the Brunswick area of eastern Georgia following resumption of normal industrial rates of pumping.

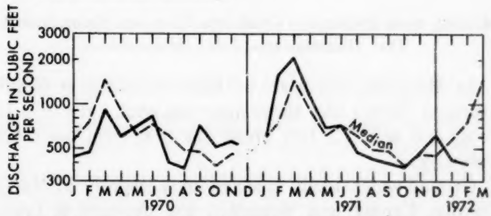
WESTERN GREAT LAKES REGION

[Ontario; Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin]

STREAMFLOW DECREASED IN NEARLY THE ENTIRE REGION, BUT ABOVE-NORMAL FLOWS PERSISTED IN MINNESOTA AND THE ADJACENT PART OF ONTARIO.

In far western Ontario, monthly and maximum daily discharges of the English River at Umfreville (drainage area, 2,470 square miles) were 1,910 and 2,260 cfs (on the 1st) respectively, highest for February in the 52 years of record. Flows have generally decreased since early November 1971, but have set new monthly and daily records for each of the four consecutive months from November through February. A persistent pattern of above-normal flows has also characterized some of the streams in Minnesota. For example, in the east-central part of the State, monthly mean discharge of Crow River at Rockford has been in the above-normal range for 17 consecutive months, and monthly flow of Buffalo River near Dilworth in the northwest has been in that range for 6 consecutive months.

In the central part of the region, flows were in the below-normal range, a consequence of light precipitation and consistantly low (sub-freezing) temperatures. Flows of nearly all streams decreased (see graph of Pecatonica River in northern Illinois).



Monthly mean discharge of Pecatonica River at Freeport, Ill. (Drainage area, 1,330 square miles.)

Ground-water levels generally declined in Michigan, Wisconsin, and Minnesota; and changed only slightly in Indiana and Ohio. Monthend levels continued above average in Minnesota; were near average in Wisconsin and Michigan (but unusually high in eastern part of Upper Peninsula); and continued below average in Ohio. Water levels in artesian wells continued to rise in the heavily pumped Minneapolis-St. Paul, Minn., area, but remained below average. Levels continued declining in the heavily pumped Milwaukee, Wis., area.

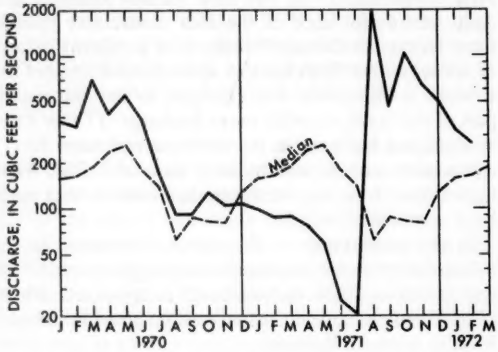
MIDCONTINENT

[Manitoba and Saskatchewan; Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas]

STREAMFLOW DECREASED IN MOST OF THE REGION, BUT INCREASED IN KANSAS, NEBRASKA, AND SOUTH DAKOTA. ABOVE-NORMAL FLOWS IN SOUTH DAKOTA AND NEBRASKA WERE IN CONTRAST TO A LARGE REGION CENTERED ON ARKANSAS WHERE STREAMFLOW WAS IN THE BELOW-NORMAL RANGE.

In Arkansas, monthly mean discharge of Buffalo River near St. Joe in the north and of Saline River near Rye in the south was only 21 percent of median for February. Decreasing flows characterized most of the Midcontinent

region including Texas (see graph of Guadalupe River near Spring Branch, in the south-central part of the State). Comal Springs at New Braunfels in south-central Texas, receded to about 294 cfs near the end of the month.



Monthly mean discharge of Guadalupe River near Spring Branch, Tex. (Drainage area, 1,315 square miles.)

In Manitoba, the level of Lake Winnipeg at Gimli, averaged 715.02 feet above mean sea level, a rise of 0.23 foot, and was 2.2 feet above the long-term mean for February.

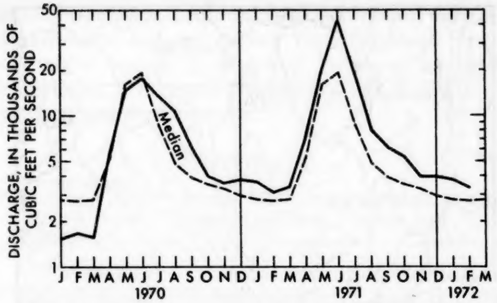
Ground-water levels changed only slightly in North Dakota, Kansas, and Nebraska; and declined in Iowa. Monthend levels were near average in North Dakota and Nebraska (except in heavily pumped areas); and remained above average in Iowa. In the rice-irrigation area of east-central Arkansas, levels declined slightly in the shallow aquifer and rose in the deep aquifer. Levels declined slightly in the deep aquifer (Sparta Sand) at Pine Bluff; levels rose at El Dorado. In Texas, levels rose in the Edwards Limestone at Austin and in the Evangeline aquifer at Houston; and declined in the Edwards Limestone at San Antonio and in the bolson deposits at El Paso. Monthend levels were above average at Austin and below average in the other three cities.

WEST

[Alberta and British Columbia; Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming]

STREAMFLOW DECREASED IN MOST OF ALBERTA, COLORADO, UTAH, ARIZONA, AND NEW MEXICO; AND GENERALLY INCREASED IN OTHER PARTS OF THE REGION. ABOVE-NORMAL FLOWS OCCURRED IN PARTS OF ALL STATES AND PROVINCES EXCEPT MONTANA, ALBERTA, AND BRITISH COLUMBIA.

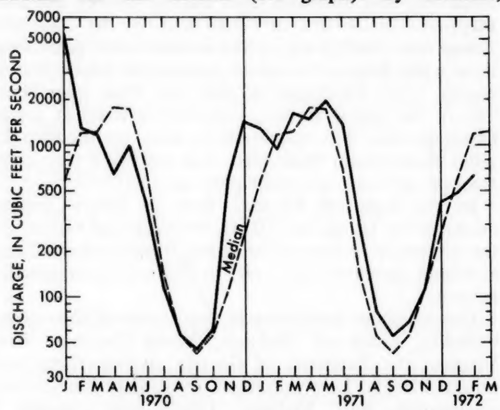
In Idaho, flow of Snake River near Heise was in the above-normal range for the 9th consecutive month. Flow at that gaging station has been above the median continuously since July 1970 (see graph). Flow of Snake River at Weiser (drainage area, 69,200 square miles) was the 2d highest for the month in 62 years of record.



Monthly mean discharge of Snake River near Heise, Idaho (Drainage area, 5,752 square miles.)

Above-normal flow continued on Humboldt River at Palisade, in northeastern Nevada, for the 21st consecutive month, and on Weber River near Oakley, in northeastern Utah, and North Platte River above Seminoe Reservoir near Sinclair in south-central Wyoming, for the 9th consecutive month.

In California, flow of North Fork American River at North Fork Dam, in the Sierra Nevada, increased seasonally but was only 48 percent of the median for the month (see graph). By contrast, flow of Smith River near Crescent City, in the northern coastal area, was above the normal range for the 2d consecutive month.



Monthly mean discharge of North Fork American River at North Fork Dam, Calif. (Drainage area, 343 square miles.)

In Arizona, flow generally decreased throughout the State and was below the normal range at index stations on Little Colorado River near Cameron in the north, Verde River below Tangle Creek above Horseshoe Dam, in the central area of the State, and at San Pedro River at Charleston, in the south.

Contents of the Colorado River Storage Project decreased 4,500 acre-feet during the month. In southern Idaho, contents of irrigation reservoirs were among the

highest of record for the month; releases were being made from several large reservoirs to provide space for spring runoff. In contrast to these above-normal conditions, contents of reservoirs in New Mexico remained far below average. In Utah, elevation of Great Salt Lake rose 0.45 foot and at monthend was 4,198.8 feet above mean sea level, 2.0 feet higher than a year ago.

Ground-water levels rose in Washington, Nevada (except in heavily pumped areas of Las Vegas and Truckee Meadows), and in central and southeastern Utah; changed only slightly in Montana and southern New Mexico; and generally declined in southern Arizona. Monthend levels were above average in Washington, Montana, and Nevada (except in heavily pumped areas); near average in southern California; and below average in southern New Mexico. In southern Idaho, monthend levels were above average in the sand-and-gravel aquifer in the Boise Valley and in the western end of the Snake Plain aquifer near Gooding; levels were below average in the Snake Plain aquifer in the Rupert-Minidoka area.

ALASKA

Streamflow decreased seasonally. Flows were only slightly above the below-normal range in the southeast and on the Kenai Peninsula south of Anchorage; and were in the above-normal range in the interior. Flow of Chena River at Fairbanks, in central Alaska, was in the above-normal range for the 5th consecutive month. Snowfall was above normal.

In the Anchorage area, ground-water levels continued to decline in both the confined and the unconfined aquifers.

HAWAII

Streamflow was in the normal range at 3 of the 4 index stations. At the station on Kauai, however, flow of East Branch of North Fork Wailua River near Lihue increased sharply, was in the above-normal range, and was more than twice the February median.

ANNUAL REPORTS ON QUALITY OF SURFACE WATERS OF THE UNITED STATES

The reports listed below contain annual records of chemical quality, suspended sediment, and water temperature of streams in the United States. These data result from water investigations by the U.S. Geological Survey, many of which are carried on in cooperation with State, Federal, and other cooperating agencies. Each report covers either water year 1966, ending September 30, 1966; or water year 1967, ending September 30, 1967. They are the most recently published volumes in this part of the Geological Survey's series of water-supply papers. The part numbers referred to in each title, correspond to those shown on the map and list on page 9.

The reports are available for reference at many of the larger public and university libraries. They may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Quality of surface waters of the United States, 1966, Parts 1 and 2, North Atlantic slope basins and south Atlantic slope and eastern Gulf of Mexico basins: U.S. Geological Survey Water-Supply Paper 1991. 1971. 984 pages. $4.00.

Quality of surface waters of the United States, 1966, Parts 3 and 4, Ohio River basin and St. Lawrence River basin: U.S. Geological Survey Water-Supply Paper 1992. 1970. 585 pages. $2.50.

Quality of surface waters of the United States, 1966, Parts 5 and 6, Hudson Bay and upper Mississippi River basins, and Missouri River basin: U.S. Geological Survey Water-Supply Paper 1993. 1971. 666 pages. $2.75.

Quality of surface waters of the United States, 1966, Parts 7 and 8, Lower Mississippi River basin and western Gulf of Mexico basins: U.S. Geological Survey Water-Supply Paper 1994. 1971. 815 pages. $3.50.

Quality of surface waters of the United States, 1966, Parts 9–11, Colorado River basin to Pacific slope basins in California: U.S. Geological Survey Water-Supply Paper 1995. 1971. 726 pages. $3.00

Quality of surface waters of the United States, 1966, Parts 12–16, North Pacific slope basins, Alaska, Hawaii and other Pacific areas: U.S. Geological Survey Water-Supply Paper 1996. 1971. 433 pages. $2.00.

Quality of surface waters of the United States, 1967, Parts 1 and 2, North Atlantic slope basins and south Atlantic slope and eastern Gulf of Mexico basins: U.S. Geological Survey Water-Supply Paper 2011. 1971. 982 pages. $4.00.

Quality of surface waters of the United States, 1967, Parts 3 and 4, Ohio River basin and St. Lawrence River basin: U.S. Geological Survey Water-Supply Paper 2012. 1971. 575 pages. $2.45.

Quality of surface waters of the United States, 1967, Parts 5 and 6, Hudson Bay and upper Mississippi River basins, and Missouri River basin: U.S. Geological Survey Water-Supply Paper 2013. 1971. 585 pages. $2.50.

Provisional data; subject to revision

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF FEBRUARY 1972

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	End of Jan. 1972 (Percent of normal maximum)	End of Feb. 1972	End of Feb. 1971	Average for end of Feb.	Normal maximum
NORTHEAST REGION					
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	46	44	61	57	223,400 (a)
QUEBEC					
Gouin (P)	42	34	61	54	6,487,000 ac-ft
Allard (P)	49	29	28	27	280,600 ac-ft
MAINE					
Seven reservoir systems (MP)	28	21	36	38	179,300 mcf
NEW HAMPSHIRE					
Lake Winnipesaukee (PR)	54	55	57	50	7,200 mcf
Lake Francis (FPR)	35	17	19	29	4,326 mcf
First Connecticut Lake (P)	24	16	25	17	3,330 mcf
VERMONT					
Somerset (P)	72	62	41	48	2,500 mcf
Harriman (P)	46	22	22	31	5,060 mcf
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	78	81	66	67	3,394 mcf
NEW YORK					
Great Sacandaga Lake (FPR)	53	40	35	35	34,270 mcf
Indian Lake (FMP)	63	51	64	40	4,500 mcf
New York City reservoir system (MW)	87	87	66	....	547,500 mg
NEW JERSEY					
Wanaque (M)	93	95	98	78	27,730 mg
PENNSYLVANIA					
Wallenpaupack (P)	76	72	52	48	6,875 mcf
Pymatuning (FMR)	78	78	85	86	8,191 mcf
MARYLAND					
Baltimore municipal system (M)	100	101	99	86	85,340 mg
SOUTHEAST REGION					
NORTH CAROLINA					
Bridgewater (Lake James) (P)	84	79	87	83	12,580 mcf
High Rock Lake (P)	77	65	100	79	10,230 mcf
Narrows (Badin Lake) (P)	102	99	106	103	5,616 mcf
SOUTH CAROLINA					
Lake Murray (P)	85	82	86	66	70,300 mcf
Lakes Marion and Moultrie (P)	93	90	90	72	81,100 mcf
SOUTH CAROLINA--GEORGIA					
Clark Hill (FP)	68	70	74	63	75,360 mcf
GEORGIA					
Burton (PR)	83	77	86	66	104,000 ac-ft
Lake Sidney Lanier (FMPR)	64	61	49	55	1,686,000 ac-ft
Sinclair (MPR)	90	91	91	85	214,000 ac-ft
ALABAMA					
Lake Martin (P)	97	90	80	75	1,373,000 ac-ft
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	47	55	47	32	1,166,000 cfsd
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	49	58	47	39	1,452,000 cfsd
Douglas Lake (FPR)	15	27	22	22	715,800 cfsd
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	56	60	57	47	523,700 cfsd
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	55	60	59	44	751,400 cfsd
WESTERN GREAT LAKES REGION					
WISCONSIN					
Chippewa and Flambeau (PR)	55	32	25	22	15,900 mcf
Wisconsin River (21 reservoirs) (PR)	48	20	19	15	17,400 mcf
MINNESOTA					
Mississippi River headwater system (FMR)	26	22	17	18	1,640,000 ac-ft

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	End of Jan. 1972 (Percent of normal maximum)	End of Feb. 1972	End of Feb. 1971	Average for end of Feb.	Normal maximum
MIDCONTINENT REGION					
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	86	84	87	....	22,640,000 ac-ft
NEBRASKA					
Lake McConaughy (IP)	88	88	88	72	1,948,000 ac-ft
OKLAHOMA					
Keystone (FPR)	86	84	87	87	661,000 ac-ft
Lake O' The Cherokees (FPR)	86	83	84	77	1,492,000 ac-ft
Tenkiller Ferry (FPR)	99	91	89	83	628,200 ac-ft
Lake Altus (FIMR)	21	22	22	53	134,500 ac-ft
Eufaula (FPR)	91	80	83	77	2,378,000 ac-ft
OKLAHOMA--TEXAS					
Lake Texoma (FMPRW)	95	86	85	85	2,722,000 ac-ft
TEXAS					
Possum Kingdom (IMPRW)	94	94	61	76	724,500 ac-ft
Buchanan (IMPW)	96	95	85	77	955,200 ac-ft
Bridgeport (IMW)	62	62	80	59	270,900 ac-ft
Eagle Mountain (IMW)	97	96	92	86	182,700 ac-ft
Medina Lake (I)	99	98	60	46	254,000 ac-ft
Lake Travis (FIMPRW)	93	95	94	76	1,144,000 ac-ft
Lake Kemp (IMW)	28	28	34	53	461,800 ac-ft
THE WEST					
ALBERTA					
Spray (P)	45	20	12	32	210,000 ac-ft
Lake Minnewanka (P)	54	50	36	41	199,700 ac-ft
St. Mary (I)	72	72	62	64	320,800 ac-ft
WASHINGTON					
Franklin D. Roosevelt Lake (IP)	94	51	95	65	5,232,000 ac-ft
Lake Chelan (PR)	28	16	39	36	676,100 ac-ft
IDAHO--WYOMING					
Upper Snake River (7 reservoirs) (IMP)	77	76	77	73	4,282,000 ac-ft
WYOMING					
Pathfinder, Seminoe, Alcova, Kortes, and Glendo Reservoirs (I)	71	72	61	33	3,016,000 ac-ft
Buffalo Bill (IP)	66	59	48	63	421,300 ac-ft
Boysen (FIP)	80	75	66	64	802,000 ac-ft
Keyhole (F)	78	79	61	30	199,900 ac-ft
COLORADO					
John Martin (FIR)	5	7	9	20	364,400 ac-ft
Colorado–Big Thompson project (I)	75	75	79	52	722,600 ac-ft
Taylor Park (IR)	63	64	93	57	106,000 ac-ft
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Navajo, and Blue Mesa Reservoirs (IFPR)	54	54	46	....	31,276,500 ac-ft
UTAH--IDAHO					
Bear Lake (IPR)	78	76	77	54	1,421,000 ac-ft
CALIFORNIA					
Hetch Hetchy (MP)	29	20	37	27	360,400 ac-ft
Lake Almanor (P)	62	59	70	45	1,036,000 ac-ft
Shasta Lake (FIPR)	77	79	79	74	4,377,000 ac-ft
Millerton Lake (FI)	61	66	75	63	503,200 ac-ft
Pine Flat (FI)	44	45	69	54	1,014,000 ac-ft
Isabella (FIR)	22	22	31	25	551,800 ac-ft
Folsom (FIP)	59	57	57	58	1,000,000 ac-ft
Lake Berryessa (FIMW)	86	87	101	86	1,600,000 ac-ft
Clair Engle Lake (Lewiston) (P)	82	85	91	83	2,438,000 ac-ft
CALIFORNIA--NEVADA					
Lake Tahoe (IPR)	70	70	71	53	744,600 ac-ft
NEVADA					
Rye Patch (I)	97	100	103	46	179,100 ac-ft
ARIZONA--NEVADA					
Lake Mead and Lake Mohave (FIMP)	70	69	65	63	27,970,000 ac-ft
ARIZONA					
San Carlos (IP)	14	13	1	18	948,600 ac-ft
Salt and Verde River system (IMPR)	51	50	53	41	2,073,000 ac-ft
NEW MEXICO					
Conchas (FIR)	44	44	69	....	352,600 ac-ft
Elephant Butte and Caballo (FIPR)	9	11	17	....	2,539,000 ac-ft

[a] Thousands of kilowatt-hours.

Provisional data; subject to revision

FLOW OF MAJOR RIVERS DURING FEBRUARY 1972

River and location	Drainage area (square miles)	Mean annual discharge through September 1970 (cfs)	February 1972: Monthly mean discharge (cfs)	Percent of median monthly discharge[1]	Change in discharge from previous month (percent)	Discharge near end of month (cfs)	(mgd)	Date
St. Lawrence River at Lake St. Lawrence[2]	295,200	239,100	230,600	107	+ 4	240,000	155,000	23
Delaware River at Trenton, N.J	6,780	11,360	10,495	94	- 21	9,170	5,900	24
Susquehanna River at Harrisburg, Pa	24,100	33,670	25,900	71	- 39	28,000	18,100	29
Potomac River near Washington, D.C	11,560	10,650	27,000	193	+177	65,900	42,600	29
Altamaha River at Doctortown, Ga	13,600	13,380	45,060	257	+ 23	39,500	25,500	25
Tombigbee River near Coatopa, Ala[3]	15,400	22,160	31,140	62	- 60	20,000	12,900	29
Missouri River at Hermann, Mo	528,200	77,480	38,900	95	- 19	40,600	26,300	25
Ohio River at Louisville, Ky[4]	91,170	110,600	198,300	102	+ 2	435,000	281,000	27
Mississippi River near Vicksburg, Miss[5]	1,144,500	552,700	556,600	80	- 20	582,000	376,000	29
Colorado River near Grand Canyon, Ariz	137,800	....	8,069	....	- 39	....	....	......
Columbia River at The Dalles, Oreg[6]	237,000	194,000	127,500	131	+ 20	....	....	......
Fraser River at Hope, British Columbia	78,300	95,300	28,900	125	+ 7	32,800	21,200	28

[1]Reference period 1931–60 or 1941–70.

[2]Records furnished by Department of the Army, Corps of Engineers, Buffalo District. Discharges shown are considered to be the same as those at Ogdensburg, N.Y., which is directly opposite Prescott, Ontario.

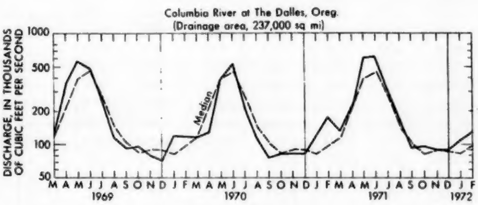
3At Demopolis lock and dam.

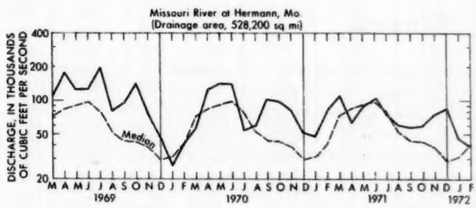
[4]Records furnished by U.S. Army, Corps of Engineers.

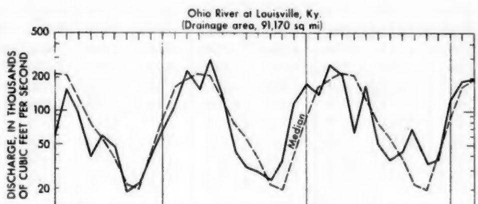
[5]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.

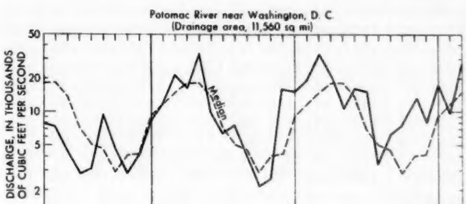
[6]Discharge (adjusted for upstream storage) determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

HYDROGRAPHS OF FOUR MAJOR RIVERS









REPORTS ON STREAM DISCHARGES IN THE UNITED STATES, JANUARY 1912 THROUGH SEPTEMBER 1960

The U.S. Geological Survey has published annual reports containing information on daily and monthly discharges of streams at stream-gaging stations for more than 70 years. For most of this period the data for the conterminous 48 states have been presented in a series of 12 or 14 regional reports ("parts") that have remained essentially unchanged in geographic name and boundary. These reports are part of the Survey's numbered series of Water-Supply Papers. Those for the period 1912 to 1960 are listed in the accompaning table.

For streams in Alaska, daily and monthly discharge records for the period 1946–50 are contained in Water-Supply Paper 1372, as are monthly summaries of streamflow records collected prior to 1946. For Hawaii, the report that initiated the annual series of streamflow reports for that State was Water-Supply Paper 318, containing daily discharges for the years 1909–11.

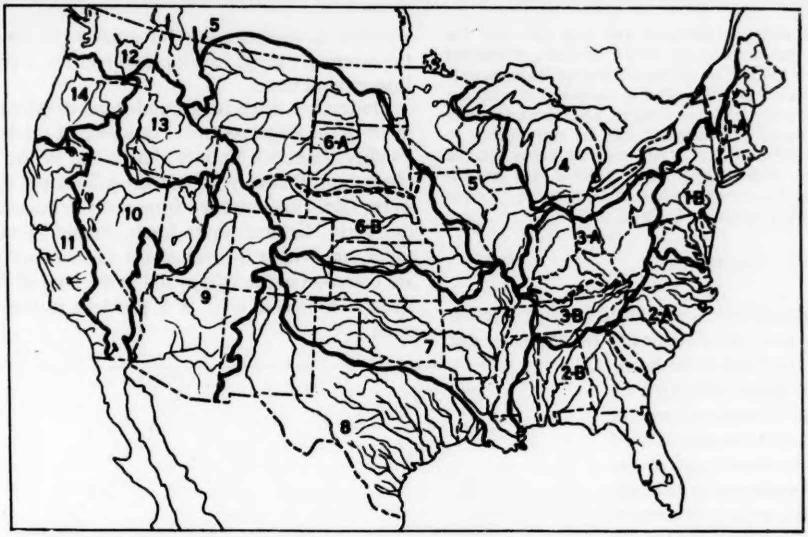
Most of the annual streamflow reports published in the Water-Supply Paper series contain data for a period of one water year—that is, from October 1 through September 30. For example, water year 1960 covered the 12-month period from October 1, 1959 through September 30, 1960. However, the reports for Hawaii from 1914 to 1960 contain data for the 12-month period ending June 30, and the reports on Hawaii for 1909–1913 contain data tabulated by calendar years. Most of the reports containing streamflow data for other parts of the United States prior to 1915 are also tabulated by calendar years.

Listed on page 9 are the names of the areas defined by regional part numbers. Part 12 was subdivided into parts 12, 13, and 14, for records beginning with water year 1914. Beginning in 1951, parts 1, 2, 3, and 6, were each subdivided into 2 sub-parts, A and B. The boundaries of these regions are also shown on the accompanying map.

The table below shows the Water-Supply Paper numbers corresponding to each year of record from 1912 to 1960, by part number or State (Alaska and Hawaii). For parts 1, 2, 3, and 6, beginning in 1951, the first of the pair of Water-Supply Papers listed is "A" and the second is "B". Two series of compilation reports contain summaries of all stream discharges by months, and maximum, mean, and minimum discharges during each year. The first compilation covered the full period of record through September of 1950 (including records prior to 1912), and the second series covered water years 1951–60. Both series are listed at the bottom of the table below. Many are available for reference at major public and university libraries and at the district offices of the Geological Survey. Reports containing daily stream discharges for water years 1961–65 were listed on page 12 of September 1971 issue of the Water Resources Review.

Water year	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10	Part 11	Part 12	Part 13	Part 14	Alaska	Hawaii
1912	321	322	323	324	325	326	327	328	329	330	331	332	332	332	-------	336
1913	351	352	353	354	355	356	357	358	359	360	361	362	362	362	-------	373
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394	-------	430
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414	-------	430
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444	-------	445
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464	-------	465
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484	-------	485
1919	501	502	503	504	505	506	507	508	509	510	511	512	513	514	-------	515
1920	501	502	503	504	505	506	507	508	509	510	511	512	513	514	-------	516
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534	-------	535
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554	-------	555
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574	-------	575
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594	-------	595
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614	-------	615
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634	-------	635
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654	-------	655
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674	-------	675
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694	-------	695
1930	696	697	698	699	700	701	702	703	704	705	706	707	708	709	-------	710
1931	711	712	713	714	715	716	717	718	719	720	721	722	723	724	-------	725
1932	726	727	728	729	730	731	732	733	734	735	736	737	738	739	-------	740
1933	741	742	743	744	745	746	747	748	749	750	751	752	753	754	-------	755
1934	756	757	758	759	760	761	762	763	764	765	766	767	768	769	-------	770
1935	781	782	783	784	785	786	787	788	789	790	791	792	793	794	-------	795
1936	801	802	803	804	805	806	807	808	809	810	811	812	813	813	-------	815
1937	821	822	823	824	825	826	827	828	829	830	831	832	833	834	-------	835
1938	851	852	853	854	855	856	857	858	859	860	861	862	863	864	-------	865
1939	871	872	873	874	875	876	877	878	879	880	881	882	883	884	-------	885
1940	891	892	893	894	895	896	897	898	899	900	901	902	903	904	-------	905
1941	921	922	923	924	925	926	927	928	929	930	931	932	933	934	-------	935
1942	951	952	953	954	955	956	957	958	959	960	961	962	963	964	-------	965
1943	971	972	973	974	975	976	977	978	979	980	981	982	983	984	-------	985
1944	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	-------	1015
1945	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	-------	1045
1946	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1372	1065
1947	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1372	1095
1948	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1372	1125
1949	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1372	1155
1950	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1372	1185
1951	1201–02	1203–04	1205–06	1207	1208	1209–10	1211	1212	1213	1214	1215	1216	1217	1218	1466	1219
1952	1231–32	1233–34	1235–36	1237	1238	1239–40	1241	1242	1243	1244	1245	1246	1247	1248	1466	1249
1953	1271–72	1273–74	1275–76	1277	1278	1279–80	1281	1282	1283	1284	1285	1286	1287	1288	1466	1289
1954	1331–32	1333–34	1335–36	1337	1338	1339–40	1341	1342	1343	1344	1345	1346	1347	1348	1486	1349
1955	1381–82	1383–84	1385–86	1387	1388	1389–90	1391	1392	1393	1394	1395	1396	1397	1398	1486	1399
1956	1431–32	1433–34	1435–36	1437	1438	1439–40	1441	1442	1443	1444	1445	1446	1447	1448	1486	1449
1957	1501–02	1503–04	1505–06	1507	1508	1509–10	1511	1512	1513	1514	1515	1516	1517	1518	1500	1569
1958	1551–52	1553–54	1555–56	1557	1558	1559–60	1561	1562	1563	1564	1565	1566	1567	1568	1570	1569
1959	1621–22	1623–24	1625–26	1627	1628	1629–30	1631	1632	1633	1634	1635	1636	1637	1638	1640	1639
1960	1701–02	1703–04	1705–06	1707	1708	1709–10	1711	1712	1713	1714	1715	1716	1717	1718	1720	1719
Compilation, to 1950	1301–02	1303–04	1305–06	1307	1308	1309–10	1311	1312	1313	1314	1315–A,B	1316	1317	1318	1372	1319
Compilation, 1951–1960	1721–22	1723–24	1725–26	1727	1728	1729–30	1731	1732	1733	1734	1735	1736	1737	1738	1740	1739

NOTE: Reports by calendar years are underlined. Reports shown above for Hawaii are for years ending June 30, except Water-Supply Papers 336 and 373, containing data for calendar years 1912 and 1913, respectively.



Boundaries of river-basin regional areas corresponding to part numbers for surface water-supply papers of the United States. The numbers and names of these areas are listed below.

Part number	*Region*
1.	North Atlantic slope basins (St. John River to York River).
1–A.	Maine to Connecticut
1–B.	New York to York River
2.	South Atlantic slope and eastern Gulf of Mexico basins (James River to Pearl River).
2–A.	James River to Savannah River.
2–B.	Ogeechee River to Pearl River.
3.	Ohio River basin.
3–A.	Ohio River basin except Cumberland and Tennessee River basins.
3–B.	Cumberland and Tennessee River basins.
4.	St. Lawrence River basin.
5.	Hudson Bay and upper Mississippi River basins.
6.	Missouri River basin.
6–A.	Missouri River basin above Sioux City, Iowa.
6–B.	Missouri River basin below Sioux City, Iowa.
7.	Lower Mississippi River basin.
8.	Western Gulf of Mexico basins.
9.	Colorado River basin.
10.	The Great Basin.
11.	Pacific slope basins in California.
12.	(Prior to 1914:) North Pacific drainage basins.
12.	(1914 to present:) Pacific slope basins in Washington and upper Columbia River basin.
13.	Snake River basin.
14.	Pacific slope basins in Oregon and lower Columbia River basin.

WATER RESOURCES REVIEW **FEBRUARY 1972**

Cover map shows generalized pattern of streamflow for February based on 22 index stream-gaging stations in Canada and 130 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations which are located near the points shown by the arrows.

Streamflow for February 1972 is compared with flow for February in the 30-year reference period 1931–60 or 1941–70. Streamflow is considered to be *below normal* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow for February is considered to be *above normal* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile).

Flow higher than the lower quartile but lower than the upper quartile is described as being within the *normal range.* In the Water Resources Review *normal flow* is defined as the median of the 30 flows of February during the reference period. The normal (median) has been obtained by ranking those 30 flows in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the normal (median).

The normal is an average (but not an arithmetic average) or middle value; half of the time you would expect the February flows to be below the median and half of the time to be above the median. Shorter reference periods are used for the Alaska index stations because of the limited records available.

Statements about *ground-water levels* refer to conditions near the end of February. Water level in each key observation well is compared with average level for the end of February determined from the entire past record for that well or from a 20-year reference period, 1951–70. *Changes in ground-water levels* unless described otherwise, are from the end of January to the end of February.

The Water Resources Review is published monthly. Special-purpose and summary issues are also published. In the United States, issues of the Review are free on application to the Water Resources Review, U.S. Geological Survey, Washington, D.C. 20242.

This issue was prepared by J.C. Kammerer, H.D. Brice, E.W. Coffay. and L.C. Fleshmon from reports of the field offices, March 6, 1972.

GEOHYDROLOGIC SUMMARY OF THE PEARL RIVER BASIN, MISSISSIPPI AND LOUISIANA

The accompanying abstract (abridged) and map are from the report, *Geohydrologic summary of the Pearl River basin, Mississippi and Louisiana*, by J.W. Lang: U.S. Geological Survey Water-Supply Paper 1899-M, 44 pages, 1972; prepared in cooperation with the U.S. Army Corps of Engineers, Mobile District. The report describes the geologic and hydrologic framework and its relationship to availability, quantity, and quality of water in a major river basin of the Gulf Coast region. Water-Supply Paper 1899-M may be purchased for $1.00 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

ABSTRACT

Fresh water in abundance is contained in large artesian reservoirs in sand and gravel deposits of Tertiary and Quaternary ages in the Pearl River basin, a watershed of 8,760 square miles (fig. 1). Shallow, water-table reservoirs occur in Quaternary deposits that blanket most of the uplands in the southern half of the basin and that are present in smaller upland areas and along streams elsewhere. About 3 billion acre-feet of ground water is in storage in the fresh-water section, which extends from the surface to depths ranging from about sea level in the extreme northern part of the basin to more than 3,000 feet below sea level in the southern part of the basin (fig. 1).

Variations in low flow for different parts of the river basin are closely related to geologic terrane and occurrence of ground water. The upland terrace belt that crosses the south-central part of the basin is underlain by permeable sand and gravel deposits and yields more than 0.20 cubic foot per second per square mile of drainage area to streamflow, whereas the northern part of the basin, underlain by clay, marl, and fine to medium sand, yields less than 0.05 cubic foot per second per square mile of drainage area. Overall, the potential surface-water supplies are large.

Because water is available at shallow depths, most of the deeper aquifers have not been developed anywhere in the basin. At many places in the south, seven or more aquifers could be developed. Well fields each capable of producing several million gallons of water a day are feasible nearly anywhere in the Pearl River basin.

Water in nearly all the aquifers is of good to excellent quality and requires little or no treatment for most uses. The water is a soft, sodium bicarbonate type and therefore has a low to moderate dissolved-solids content. Mineral content increases generally downdip in an aquifer. Excessive iron, common in shallow aquifers, is objectionable for some water uses. Water from the streams, except in salty tidal reaches, is less mineralized than ground water.

Moderately intensive ground-water development has been made in the Bogalusa area, Louisiana; at the Mississippi Test Facility, Hancock County, Miss.; and in the Jackson area, Mississippi. Probably 20 million gallons per day of artesian water flows uncontrolled from wells in the southern part of the basin. Ground-water levels, except in the higher altitudes, are within 60 feet of the surface, and flowing wells are common in the valleys and in the coastal Pine Meadows. Decline of water level is a problem in only a few small areas.

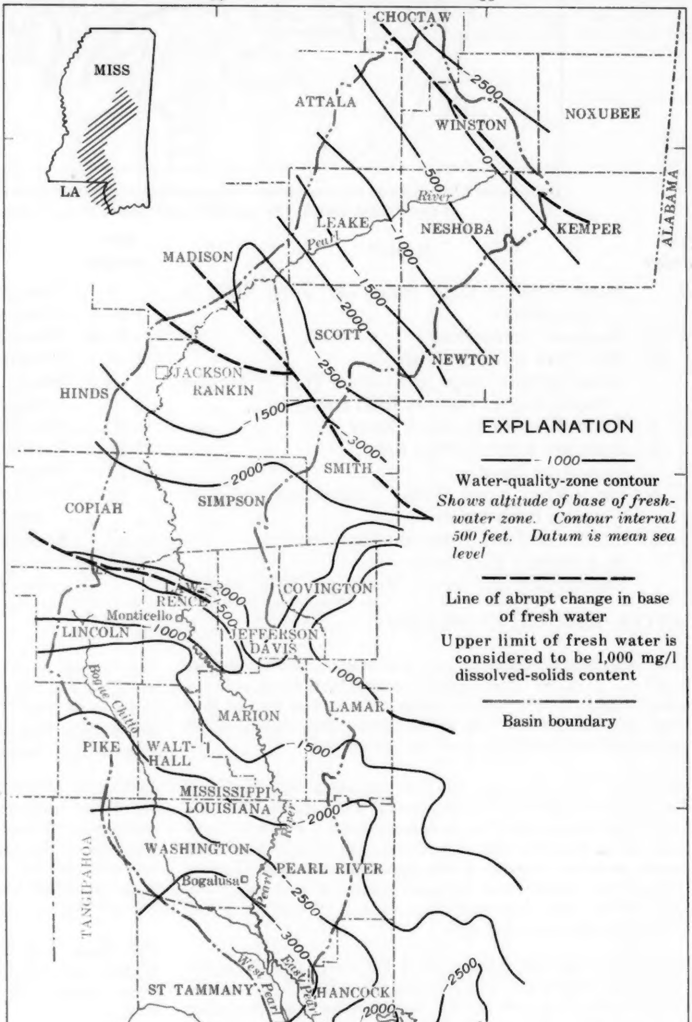


Figure 1.—Configuration of the base of fresh ground water.